A

SYNOPSIS

OF A

COURSE OF LECTURES,

ON THE

THEORY AND PRACTICE

OF

MEDICINE.

IN FOUR PARTS.

PART THE FIRST.

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To the STUDENTS of NATURE,
IN THE
UNIVERSITY of CAMBRIDGE.

Gentlemen,

IF one of the moſt celebrated Profeſſors* of the age had reaſon to ſay, that to deliver a ſyſtem of the doctrines and rules proper for directing the practice of Phyſic, was an undertaking attended with ſuch great difficulty, that after an experience of *forty years*, as well as much reading and reflection, it was with great diffidence he entered upon ſuch a work.—With how much more diffidence ought one to appear who cannot boaſt of either?

I always intended to preſent my hearers with a *Synopſis* of my *Courſe* of *Lectures*, when years and more experience ſhould give me ſufficient confidence; but ſeveral circumſtances concurring at this time, induce me to offer you the FIRST PART of my deſign, crude and imperfect as it is.

Prejudices have operated againſt our Medical Inſtitution in general; and although the preli-

 minary

* Cullen in his preface.

minary or auxilliary branches, *Anatomy*, *Botany*, *Chymiſtry* and *Natural Philoſophy*, are allowed to be not altogether uſeleſs or void of entertainment, yet the THEORY AND PRACTICE OF PHYSIC, which comprehends and connects them all, is repreſented as neither uſeful nor entertaining, and if neceſſary, eaſier collected from books than lectures. Although every thing in nature hath a reference to the *human perſon*, yet the Phyſician may obſerve that ſome things here treated of, or rather the view in which they are exhibited, can hardly be called medical.—This will be ſufficiently explained when it is known that hitherto far the greateſt part of my hearers mean not to purſue phyſic as a profeſſion; but, in imitation of ſeveral illuſtrious characters, wiſh only to fill up their liberal leiſure in that moſt uſeful of all ſtudies, the knowledge of themſelves. It hath been lamented that thoſe who have ſtudied the philoſophy of the human mind, have been little acquainted with the ſtructure of the human body and the laws of the animal œconomy; notwithſtanding the mind and the body are ſo intimately connected, and have ſuch a mutual influence on one another, that the conſtitution of either, examined *a part*, can never be thoroughly underſtood.*

In

* Dr. Gregory.

In conſideration of your various purſuits, we have gone one ſtep further, and encouraged you to ſtudy man in relation to other animals and things; and glancing at the wondrous *chain* of univerſal exiſtence, have called your attention to ſome of its links; and this in order that you might view this "goodly frame" in the light of a large and well regulated family, all ſubſervient to each other in proper *ſubordination*,—all contributing in their proper places to the perfection and happineſs of the whole. In contemplating the *principle of animation* through the innumerable ſpecies of beaſts, birds, fiſhes and inſects, 'till we reached the vegetable, we have been led on to enquire, whether theſe two tribes of organized beings do not form (inſtead of two diſtinct kingdoms) one *immenſe family?*

Thus, without neglecting the doctrine of diſeaſes, and their remedies, have we endeavoured to give you a more pleaſing picture of man and his relations, than what mere medical lectures afford; and I was glad of ſuch an opportunity to combat certain prejudices: for when I reflected how all the ſciences commonly taught in Univerſities were linked together, I felt a repugnance to the idea of phyſic being *inſulated*, and wiſhed to ſuggeſt to you that the

the art of medicine, when properly purſued, actually comprehended more of the ſciences than any other branch of knowledge you could name,—that man, placed at the head of the viſible ſeries, was an *Epitome* or compendium of the great world, and included within himſelf all the powers and properties of nature, *vegetable*, *mineral*, *animal* and *intellectual*,—that ſuch a knowledge of him was ſo eſſential to the human race, that without it the great *Linnæus* ſeems to doubt whether any other characters be ſufficient to entitle one to be ranked among mankind; for ſays he, "*Hæc ſi noveris* HOMO *es*, *et a reliquis animalibus diſtinctiſſimum genus.*"

Natural Hiſtory is not introduced here barely to amuſe, but with a hope that by cultivating a taſte for the works of nature ſome ſolid advantages may ariſe. The American may poſſibly be reminded, in his reſearches, that while factitious wealth is dug up from the bowels of the earth, *our* only true and ſolid riches muſt be drawn from its *upper ſtratum*, from thence man receives a reward of his honeſt induſtry by a kind of perpetual miracle wrought in his favour.

Should we not, moreover, encourage the natural curioſity of our countrymen to read that *ſacred ſcripture* written by the finger of the DEITY himſelf,

himſelf, upon every *animal*, every *plant*, and every *mineral?* An uncorrupted ſcripture this! A kind of ſecond revelation! The GREAT BOOK OF NATURE, which comprehends the objects of every ſcience, is peculiarly inviting in this country; its ample pages ſtrike all who have eyes to ſee and hearts to feel!

SOME have ſaid, theſe ſubjects, though curious, are foreign to the medical profeſſion—but they are miſtaken. Where did HIPPOCRATES, and other Princes of the art, ſtudy? Wherever there were men, and the concomitants of humanity, diſeaſe and death,—AIR, EARTH and WATER,—all that ſurrounded them were the pages they ſtudied.

The utility of a SYNOPSIS need not be dwelt on. Method is the ſoul of ſcience; by it a confuſed heap of facts may be ſo ranged and diſpoſed, that the judgment may act with freedom, and perform its office with advantage.* After the ſubject of an enquiry is fixed on, and well defined, it ſhould be divided into particular heads of enquiry: then the order of the things themſelves are to be ranged and digeſted into the form of regular tables, ſo that the mind may act upon them in juſt order and with regularity; *the whole to be ſo conſtructed as to admit of being tranſpoſed, added to, or corrected.** The

* See preface to *Novum Organ.*

The SYNOPSIS is divided into *four parts*. The FIRST PART is in your hands.

Although moſt of the ſubjects here mentioned have been treated of by men of eminence, the Phyſician will however ſee that we have taken a different view of the ſame ſubject from what is found in authors, and as far as I know among lecturers. Whole aphoriſms are inſerted upon ſome ſubjects, where we knew of no book that could ſerve as a guide to the pupil. The aphoriſms on the *Vis vitalis* may ſerve as an example. The obſcurity in which the proceſs of *digeſtion* was involved till very lately, will ſerve to explain the length of that ſection; the ſame may be ſaid of the *Lymphatic ſyſtem*, while the well eſtabliſhed doctrine of the *circulation* will explain the brevity of that ſubject. Under this head, ſome entire ſentences are taken from *Fordyce* and *Haller* to comment on, and wherever we have taken the ſame liberty with any author, it is mentioned in the margin in general, and in the lectures in particular.

The SECOND PART treats of the more obvious cauſes of diſeaſes,—the atmoſphere—the ſituation—the diet—and then of particular ACUTE DISEASES; which will be treated of according to the plan firſt ſuggeſted by SYDENHAM, namely, arranged like the ſubjects of natural hiſtory into *claſſes*,

claſſes, *orders*, *genera* and *ſpecies*. By ſuch an aſſiſtance the ſtudent of nature is led as it were by an *Ariadne's clue*, through the turnings and labyrinths of the *three kingdoms* of nature, and without a ſimilar one, the ſtudent of medicine could ſcarcely retain the deſcription of diſeaſes, or remember how they are treated.

The THIRD PART treats of CHRONIC DISEASES, beginning with the moſt ſimple, and ending with the moſt complicated.

The FOURTH PART conſiders the OPERATION OF MEDICINES, and treats of the METHODUS CONCINNANDI FORMULAS MEDICAMENTORUM.

In the execution of our plan, we wiſh not to hold up what we have to offer to you as our own ſelf-created knowledge, but rather what we have collected from the writings of approved authors, from lectures, and from the communications of eminent men. Neither ſhall we endeavour to ſtamp a dignity on any of our inventions by the triumphs of confutation, the citation of antiquity, or the maſk of obſcurity,* but try to lead you on to things and their relations; and avoiding as much as poſſible all technical terms, we ſhall en-

* *Novum Organ.*

deavour to expreſs ourſelves in ſo plain and ſimple a ſtyle, as to require no other preparation than common ſenſe, and an unprejudiced mind.

BOSTON, *May*, 1786.

SYNOPSIS

OF A

COURSE OF LECTURES.

CHAPTER I.

History of SCIENCE *in general, and* MEDICINE *in particular.*

THE intentions of our forefathers in founding this College. The idea the Romans had of *education* evident from the origin of that word. The difference in the minds of men, not so much the effect of organization as education. The aptitude to understanding is a dead power in man, when not vivified by passions. The passion of *glory*, the commonly exciting cause. All men are susceptible of it in countries where glory conducts to power.* Reflections on the progress of civilization from the naked savage to polished humanity. Times and countries have their wastes and deserts. What form of government, and at what period most favourable to learning.

* See Helvetius,

Computation of the numbers of the human ſpecies deſtroyed in building up tyranny, by *Seſoſtris*, by *Semiramis*, by *Xerxes*, by *Alexander*, the *Romans*, the *Sicilians*, by *Mithridates*, the *Goths* and *Vandals*, the *Cruſadors*, and by the *Europeans* on this continent.

The arts and ſciences commonly flouriſh immediately after civil wars and commotions. Some of the moſt diſtinguiſhed benefactors of mankind, when and where they lived—of thoſe few who have aggrandized the human mind by cultivating their own.

Diſtribution of knowledge into particular ſciences. PHILOSOPHY divided into the doctrine of the *Deity*—of *Nature*—and of *Man*. The doctrine of MAN divided into the doctrine of the *body*, and of the *mind*—and the doctrine of the *union*.

Of the intimate connection of all the ſciences—the propriety of making the *Muſes* all ſiſters.

The univerſe affords nothing ſo deſerving our conſideration and wonder as *ourſelves*.—The human body, of all created things, moſt capable of relief; yet this relief moſt liable to err.

A claſſical inveſtigation of the origin of the *Healing Art*. The fables of the antients pregnant with wiſdom.

The

The antient poetry divided into (1) The *Narrative*—(2) The *Dramatic*—(3) *Allegorical*. From the *allegorical* the origin of medicine muſt be drawn. How the ſciences were firſt taught by *ſigns* and *ſymbols*. As hieroglyphics preceded letters, ſo allegories preceded arguments,—various examples. This mode of teaching ſtill among the *Chineſe*, and in ſome degree among our *Indians*. The importance of a *clue* to theſe allegories, they having *nature* for their baſis. How the ſymbols of ideas came to be taken for ideas themſelves, truth came mixed with falſehood, human things with divine. Among all the ruder nations, the *Prieſt*, the *Conjuror* and *Phyſician*, were united in one man—other ſources of ſuperſtition and nonſenſe—ſome traces diſcernable ſtill in the *Materia Medica*.

Explanation of the allegory of *Apollo* or *Phœbus*:—Why called the *God* of *Phyſic*. The ſagacity of the poets in making *Æſculapius* and *Circe*, brother and ſiſter, and both children of *Apollo*.

An account of ſome of the Grecian Philoſophers and Phyſicians who flouriſhed during the period of Grecian liberty. *Marcus Cato's* opinion of them in his day.

Of

Of HIPPOCRATES, why called the father of the Medical art—a ſpecimen of his doctrine—a criterion by which his genuine works may be known—imitated by ſeveral, equalled by none—reflections on the age of the poliſhed world, from the rich treaſure of knowledge found in his writings—who firſt differed from *Hippocrates*—when and how Phyſicians were divided into ſects—of the *Dogmatic*, *Emperic* and *Methodic* ſects—account of *Aſclepiades*, and his innovations in practice—his arts to acquire popularity and fortune.

An account of GALEN, wherein he did more harm than good to medicine, and acquired more fame than he deſerved.

A ſhort hiſtory of the various ſects that flouriſhed from this period to the time the *Weſtern Empire* was overran by the Goths, and the *Eaſtern* by the Arabs.

How a northern ſwarm of barbarians extinguiſhed the ſmall light of learning that then remained, burning the libraries, univerſities and cities. Concerning *Mahomet's* conqueſts. From the 9th century to the 12th, the Arabians engroſſed the province of phyſic, how far they enlarged its boundaries. In the 15th century Conſtantinople was ſacked, the Greeks driven out, and forced to take refuge in Europe. The writers

writers from this time called *Moderns*. Hence there appears three periods or revolutions of learning; *one* among the GREEKS, *another* among the ROMANS, and a *third* among the WESTERN nations of *Europe*.

MEDICINE, long cultivated on the coaſt of *Malabar*, derives its origin according to them, from the ſupreme God, and handed down for myriads of ages through the ſucceſſive orders of inferior Deities;—reflections thereon,—a ſpecimen of their theory. Of the ſtate of phyſic in *Mexico* and *Peru*: their method of acquiring a knowledge of the healing-art more wiſe than any unlettered people yet known.

The *revival or reſurrection of letters*. The nobles of all nations flocking to the holy war, admired the art and cultivation of the Greeks and Romans, ſhrunk back at their own barbarity—the conſequences thence ariſing. How for ſeveral centuries the admiration of the knowledge of former ages retarded the advancement of ſcience.

Elogium on ROGER BACON.

The diſcovery of the ARS ARTIUM OMNIUM CONSERVATRIX, the *Art of Printing*, and its immediate conſequences.

The *two ſyſtems* of PHILOSOPHY prevalent at this period, viz.—The Philoſophy of *Ariſtotle*, and the Philoſophy of *Plato*: the firſt occupied the

the *univerſities* and *cloiſters*. The poets, ſentimental philoſophers, and ſome others, were diſciples of *Plato*. Theſe two ſyſtems more or leſs diſcernable in all the writings of this period.

A great revolution in the theory and practice of Phyſic, by the introduction of *Chymiſtry*. An account of *Paracelſus* and his followers.

A ſhort hiſtory of *Medical Chymiſtry*, in contradiſtinction to that very ancient art of ſmelting, refining and tempering of metals.

New diſeaſes and *new* remedies, in conſequence of a great part of the earth being diſcovered unknown to the ancients, viz. *America*,—the *ſouthern parts* of *Africa*,—*China* and *Siberia*,—together with a vaſt *number* of *iſlands*.

In the 17th century HARVEY demonſtrated the *Circulation of the blood*, which, together with the diſcovery of the *Receptacle of the Chyle* and of the *Thoracic-Duct*, overturned the whole ſyſtem of Galen and the theory of the Chymiſts. GALILEO now introduced mathematical reaſoning, and BACON his new mode of induction. This the æra of experiment in which ſeveral great men flouriſhed.—Societies eſtabliſhed for promoting and diffuſing experimental philoſophy in ſeveral parts of Europe with princes for their patrons.—Poſts or conveyances by letter eſtabliſhed.—*Anatomy* now proſecuted with juſter views than

before

before the discovery of the circulation.—*Injections* of coloured liquors first introduced.—The *Microscope* applied to investigate the more subtile parts of the body.

A catalogue of the most important *anatomical discoveries* from that time to the present.

General account of Theories from HARVEY to the time of HOFFMAN.

1. The *Mathematical* or *Mechanical Theory*, in which the blood was considered as the *primum mobile* of the whole body. How the consequences of this doctrine destroyed the principles on which it was founded.

2. The Theory of STAHL, who maintained that the rational and immaterial soul itself was the source of all the motions of the body.

3. The Theory of BOERHAAVE.

4. HOFFMAN'S Theory, who maintained that so far was the body from depending on a state of the fluids as *Boerhaave* imagined, that the crasis of the fluids themselves entirely depended on the nervous power, and that the greatest part of diseases were affections of the *nervous system*.

General reflections on the foregoing history,—why it appears the history of *opinions* rather than of a progressive art.

An account of the few eminent authors in phyſic, in compariſon of whom the reſt are mere compilers.—Fewer books written on phyſic than any other branch of ſcience of its extent.

On the *ſimplicity* of the medical art at preſent, compared with a century ago. By injections and microſcopes, obſcure things now rendered conſpicuous, minute things magnified, and from confuſion reduced to order and ſimplicity.

The more we know of any ſcience, the greater number of *particulars* are we able to reſolve into *general ones*, and conſequently we ſhall be able to reduce its principles within narrower bounds.* This opinion verified by the preſent ſtate of medicine.

The almoſt endleſs catalogue of diſeaſes that afflict mankind a principal diſcouragement to ſtudents—how remedied.

Sydenham was the firſt who ſuggeſted the idea of reducing diſeaſes to a certain determinate ſpecies, in imitation of botanic writers. *Sauvages* the firſt who attempted it.—*Linnæus*—*Vogel*—*Sagar* and *Cullen*, the greateſt improvers.

All ſcholaſtic teaching is *claſſification*,—exemplified in the diviſion of the works of creation, firſt into

* Prieſtley.

into the *four elements*, then into the *three kingdoms*. The animal kingdom divided into *ſix claſſes*, comprehending all animated nature; theſe claſſes divided into *orders*, each order into *genera*, each genus into *ſpecies*.

The CLASSES are marked by certain ſymptoms and circumſtances which are common to each; the *orders* all agree in having the ſame marks with the *claſs* to which they belong, together with ſome additional ones peculiar to the *order*; the *genera* have all the marks and circumſtances of the *claſs* and *order*, and beſides have ſome which diſtinguiſh the *genus*; and the ſpecies have all the marks and tokens of *claſs*, *order* and *genus*, with the ſtill further addition of ſymptoms or circumſtances which give the *ſpecific character*. See *Encyclop. Brit.*—alſo *Lock on Human Underſtanding*, *vol.* 1, *p.* 357, 8*vo.* *and vol.* 2, *chap.* 3, *on general terms*.

All the known diſeaſes that afflict mankind reduced to *four* claſſes, and theſe to 150 genera.*

The MATERIA MEDICA leſs advanced than any other branch of the art; the *inſtinctive principle* more exerciſed in what we take into the ſtomach than

* See part the ſecond.

than the *rational*, one cauſe. *Falſe Criteria* another,—theſe reduced to eight heads.*

Mercury—*Antimony*—*Opium*—*Peruvian-Bark*, a few other *Vegetables*—*Fire*, *Exerciſe* and *Water*, include near all the phyſicians inſtruments.

Enumeration of the principal *Deſiderata* in *Anatomy*—in the doctrine of the *Animal œconomy*—in *Surgery*—and in the *Therapeutica*.

A view of the *Data* and *Quæſita* in the art of phyſic.

The general problem which comprehends the whole art is,—

Having the ſymptoms given to find the remedy; or thus divided,

(*a.*) *Having the ſymptoms given to find the deviations of the body from its natural ſtate.*

(*b.*) *Having* this *deviation given to find the remedy.*

It is uſeful to invert theſe problems, and enquire,

(*a.*) *Having the deviations given, what the ſymptoms muſt be.*

(*b.*) *Having the manner of operation of a ſucceſsful remedy given, what the deviation muſt be.* (See Hartley, vol. 1ſt.)

BOERHAAVE's method of ſtudying phyſic—his idea of a conſummate phyſician.

HOFFMAN's

* See part the fourth.

HOFFMAN'S method, considered under *four heads.*

A rehearsal of Dr. CULLEN'S objections to the *Boerhaavian system.*—How far he has supplied its deficiencies.

The out-lines of *Cullen's Physiology*, wherein he differs from all other medical teachers.

Elogium on BOERHAAVE.

General reflections on the various methods recommended in studying physic. Of the remarkable simplicity observable in the writings of the most successful enquiries after truth—several instances adduced.

Where did HIPPOCRATES, and other PRINCES in the art, study?—Wherever there were men and the concomitants of humanity, diseases and death, *air*, *earth* and *water*, all that surrounded them were the pages they studied!

CHAP. II.

SECTION I.

MAN, the object of our enquiries, includes within himself all the powers and qualities of nature, viz.—the *mineral*, *vegetable*, *animal*

mal and *intellectual* ; therefore has been called the *Microcosmos*.

Of the *Res Macrocosmæ*, or every thing but man. These distinguished into (1.) Aliments, (2.) Medicines, and (3.) Poisons.

Concerning simple matter ;—its astonishing divisibility, illustrated chemically and mechanically. The infinite divisibility of matter a mathematical truth, but a physical falshood ? A little of the middle of nature known, its two extremes out of sight.

What led some philosophers to believe that all nature was animated. The imperceptible translations of inert matter to organized—from a vegetating body to the lowest order of animals.

Of the *Zoophytes*, or that class of beings which connects, animated and insensible nature.

On the Scale of Beings.

The Universe a system whose very essence consists in *subordination*.

Systema Naturæ of *Linnæus* briefly explained.

A connection between all ranks and orders by subordinate degrees necessary towards sustaining the magnificent fabric of the world. Wide distinctions made in the *dignity* and *perfections* of animals,

animals, little or none in their happineſs. Concerning the various degrees of perfection, beauty, ſtrength and underſtanding.

The animal produced by a cutting as in the *Zoophytes*, is but *one degree* above a vegetable,—that produced from an egg is a *ſtep higher*,—that claſs of animals which is brought forth alive, *ſtill more exalted*,—and of theſe, ſuch as bring forth one at a time, *the moſt compleat*, the foremoſt of which ſtands the great maſter of all,*

MAN,—The knowledge of him reduced to ſix heads,—(1.) Phyſiologice, (2.) Diætetice, (3.) Pathologice, (4.) Naturaliter, (5.) Politice, and (6.) Theologice. "*Hæc ſi noveris Homo es, et a relinquis animalibus, diſtinctiſſimum genus.*" LINNÆUS.

"Man is a machine," *Des Cartes.*

Wherein the meaneſt animal is eſſentially ſuperior to the moſt perfect reſult of human workmanſhip.

In proportion to the degradation of the animal in the ſcale of exiſtence, the living and renovating principle is proportionably vigorous; various examples

* Goldſmith.

examples adduced; the ſame law obſerved in *vegetables*.

An effort towards a perpetuity of exiſtence diſtinguiſhes the works of the *Supreme Creator* from the works of art.

Analogy between the *inſtinctive* or *preſerving* principle in animals, and that *approximating principle* which binds together the terreſtial globe, which guides the revolving planets in their courſes, and keeps the material ſyſtem from diſſolution.*

Man is a being compounded of *body*, *ſpirit* and *ſoul*, or *Corpus*, *Vis Actuoſa* et *Mens*.

The Body firſt offers itſelf to view—conſidered collectively as one maſs, conſiſts of (1.) Earth, (2.) Oil, (3.) Water, (4.) Salt, (5.) Phlogiſton, and (6.) Mephitic air. Conſidered entire, and particularly its exquiſite form and wonderful faculties, place it at the head of the viſible ſeries. Amidſt the exact harmony of parts and actions, there exiſts a perpetual conflict; by this conflict the body is ſupported; that action which is the life of the body is alſo the cauſe of its death.

From which view this inference is unavoidable, namely, the moſt perfect being we know of, depends on a Superior Being who created and ſupports its exiſtence.

SECTION

* Jennings.

SECTION II.

THE actions of the human body diſtinguiſhed into VOLUNTARY, INVOLUNTARY and MIXED.

The involuntary, or inſtinctive movements, are exerciſed in preſerving the body, and are, more ſtrictly ſpeaking, the *animal œconomy*.

The appetites and actions on which our very exiſtence depends, are not left to the fallible reaſon, or caprice of man.

The inſtinctive actions varying in different ſtages and circumſtances of life, are *ſtrong* in proportion to their importance:—various inſtances adduced.

All this depends on a principle which ſome call VIS ACTUOSA, others IMPETUM FACIENS, others ARCHÆUS. This power is *innate*, and is that, by which man lives, it forms him, it nouriſhes him, refreſhes him, pathetically affects him, moves him, animates him; by it he feels, he deſires, refuſes, ſleeps and wakes: nevertheleſs it is totally different from the *mind*, for,

In the body, guarded by the *Autocratea*, or VIS MEDICATRIX NATURÆ is found ſomething of quite a different nature from what has been mentioned;—a *power* of thinking, reflecting, comparing, chuſing, and repreſenting to itſelf

paſt, preſent, and to come. This power in relation to its ſeveral operations, is termed comprehenſion, underſtanding, reaſon, mind, will, freedom, or collectively by the ſingle word SOUL.

This immaterial thinking part of man, is ſo connected with the material and corporeal part of him, and particularly with the *nervous ſyſtem*, that motions excited in this, give occaſion to thought; and thought, however occaſioned, gives riſe to new motions in the *nervous ſyſtem*. This mutual influence we aſſume with confidence as a fact, but the mode of it we do not underſtand.*

The opinion of THALES concerning the immaterial thinking part of Man—of PLATO—of PATHAGORAS and of HIPPOCRATES.

The *Carteſian Hypotheſis*—the opinion of ſome of the *Chemiſts*, of the THEOSOPHI, particularly MALBRANCHE. The ſyſtem of LEIBNITZ and WOLFE,—of BAXTER and PRIESTLEY.—All abounding with unſurmountable difficulties. †

SECTION

* Cullen's Phyſiology.

† While the *Divine* ought to conſider Man as made up of two diſtinct eſſences, and as poſſeſſing an immortal ſoul after the image of his Maker, the *Phyſiologiſt* in a humbler walk, is bound by the rigid rules of phyloſophizing, to conſider him as poſſeſſed of an amazing fabric, on whoſe perfect, or imperfect ſtate, its functions and faculties ſeem to depend. All the knowledge the Phyſiologiſt pretends to, he derives from *Experiment, or the uſe of his ſenſes.*

SECTION III.

ON the original conſtruction of the animal Solids.—Do they conſiſt of ſtreight fibres or threads, as *Boerhaave* taught; or fibres and laminæ forming the Tela Celluloſa, as *Haller* ſuppoſed? Or are they ſpiral, convoluted and interwoven with one another?

The conſtruction, extent, and nature of the *Tela Celluloſa*.—On the living, or vital Solids.

All the organical parts of the human body maintained in the *power*, or *fitneſs* for acting either ſucceſſively, or ſimultaneouſly by *two forces* or *ſprings*, viz. (1.) The BRAIN and *it's appendages the nerves*. (2.) The HEART and *it's appendages the Blood-Veſſels*, mutually exciting each other like the *main-ſpring* and *regulator* in a Watch. —Theſe movements, in order to be perpetual and regular, require to be as perpetually and regularly *wound up*, and this is done by the FOOD taken into the ſtomach and there digeſted.

The Brain and Nerves may be conſidered as forming *one ſyſtem*. The Heart and Blood-Veſſels *another*. The Stomach, Inteſtines and aſſiſtant Chylopoetic Viſcera form a *third*. The Lacteals, the common Lymphatics, and the Conglobate-Glands form a *fourth*. May not the *Syſtema ſpiritale pneumonicum* be conſidered as a *fifth?*

From theſe *five fountains* all the actions of the body, and all the power which it exerts, are derived.

Although each organ or ſyſtem of the human body, has an action peculiar to itſelf, yet are they all actuated by *one individual life*. *

Human life or health, is the ſum or aggregate of all theſe actions and functions, which cannot therefore be derived from the brain alone, or heart, or ſtomach—or abſorbent ſyſtem—or the pneumonic, but from the conſpiration of all of them ; hence emerges the *ſympathy of parts*. †

Theſe ſubjects are ſo involved in each other, that it is impoſſible to begin any where on clear ground, or ſo as to proceed from the *Data*, to the *Quæſita* : begin where we will, we always find ſome things neceſſary to be premiſed, which are not as yet demonſtrated.

CHAP. III.

Of particular Organs and Functions.

SECTION I.

Of the Heart and Blood-Veſſels.

THE heart of man conſiſts eſſentially of two cavities, there being two hearts, ſtrictly ſpeaking, joined together in the human body, ſerving

* In ſome Animals, Life is diviſible, as in the *Zoophytes*.

† See Diſſertatio *de Sympathia partium corporis humani*, &c. printed at Leyden, in 1780.

ſerving for two circulations of the blood, one through every part of the body, and one through the lungs. *

Of the AURICLE.

Of the VENTRICLE.

Of the VALVES.

Origin, general ſtructure, and diſtribution of the *Aorta*.

From the ultimate branches of the Aorta ariſe tubes which terminate in the heart, joining together as they go on towards it, forming principally two large tubes, which open into the right Auricle :—theſe are called, †

VEINS,—their general ſtructure.

In all the veins perpendicular to the horizon, excepting the Uterus and Porta, there are ſmall valves, but none in the deep running veſſels of the Viſcera—none in the Lungs, Brain, Liver, or the whole ſyſtem of the Væna Portarum—nor in any blood-veſſels, leſs than the twelfth of an inch, diameter. ‡

How do the veins begin ? There is a ſtructure between the veins and arteries little underſtood. §

The blood-veſſels in a live animal are always full. When

* Fordyce Natural Hiſtory of human Body.

† Ibid. ‡ Haller's Phyſiology.

§ See Malpigh and Ruyſch.

When an animal dies, the Arteries and Veins loose their cylindrical form and are flattened, and the capillaries contain less blood, so that the blood sufficient to fill the vessels when the animal was alive, is not capable of filling them after he is dead; therefore the arteries, veins and capillaries of the living animal, are commonly contracted to a greater degree than they can be by their elasticity. †

The elasticity is commonly endeavouring to distend them, but is always overpowered by the contractile power depending on life, which adapts the size of the vessels to the quantity of blood contained in them.

If the vessels are emptied to such a degree that they cannot adapt themselves to the blood, and continue cylindrical, the animal dies.‡

On the *Vis Vitalis*.

Aphorism I.

ALL the living parts of the body have, besides those attributes common to all bodies, as solidity, extension and gravity, a peculiar *something* which distinguishes the living from a dead body.

A muscular fibre will contract, and that not by the power of gravitation, cohesion, chrystallization, *(electricity?)* magnetism, or chymical attraction.

Aph.

† Fordyce. ‡ Ibid.

APH. II.

This property in animal bodies has been in a great meaſure overlooked by ſome teachers of great reputation, and totally neglected by others.

APH. III.

Whatever by its contact with an animal fibre, excites in it a contraction or oſcillation, we call a *Stimulus*.

APH. IV.

That ſtate of an animal fibre in which a contraction or oſcillation is produced by the contact of a ſtimulus, we call *Irritability*.

APH. V.

That principle in animals, on which ſenſation, motion, and all the animal powers depend, we call the VIS VITALIS.

APH. VI.

If by the application of a ſtimulus to the ſolids, a perception is excited in the mind, this effect we call *ſenſation* or *facultas ſentiendi*.

APH. VII.

By the action of ſtimuli on the ſolids, the *Vis Vitalis* is excited and preſerved; when diminiſhed, it may be encreaſed, and when totally ſuſpended, it may be reſtored.

APH.

APH. VIII.

Without *heat* as an *exciting* and *preſerving ſtimulus*, vegetable and animal life cannot be ſupported. Thus the hatching of eggs is the effect of the application of a particular degree of heat, without which the egg remains inanimate. The ſame application to an animal, or part of an animal conſolidated by froſt, will re-animate it, or reſtore the *Vis Vitalis*.

APH. IX.

Different animals, and the various parts of the ſame animal, have different degrees of irritability.

APH. X.

The denſer, or more compact the ſolids of an animal, or parts of an animal, the ſtronger and leſs irritable is the animal or parts of the animal. Thus the muſcles are in a great degree irritable, but their irritability leſſens as they become tendinous, and is in a manner loſt when oſſified.

APH. XI.

On the contrary, when by inflammation the fibres of the leaſt ſenſible parts are elongated, and the coheſion of their conſtituent corpuſcles diminiſhed, their irritability and ſenſibility is proportionably encreaſed until it arrives at the extreme, when the ſenſibility and irritability diminiſhes until it is loſt, and a diſſolution takes place.

APH. XII.

APH. XII.

Experiment teaches us, that the *Heart* is endowed with irritability above moſt other parts. Even when the heart is taken out of the body, and in ſome animals though it be cut in pieces, it can be excited to motion by proper ſtimuli*.

SECTION III.

Nature and Properties of the *Blood*.

THE various ſubſtances uſed for food, are converted by the organs of digeſtion into chyle, and afterwards into blood.

FROM this red maſs all the other fluids are formed. The conſtituent parts of the blood unknown till the time of Monſieur Senac.

THE blood conſiſts of (1.) The ſerum. (2.) Coaguable Lymph. (3.) The red part, and (4.) The ſuperfluous water. The nature, properties, and mode of mixture in each. Little or nothing to be known from the chymical analyſis of the red maſs.

Leuwenhock's idea of the red gloubles erroneous. Neceſſary to know the fallacies of optics before their ſhape can be determined.

* Theſe Aphoriſms, which are meant to be the foundation of a particular work, will be continued in another part of the Synopſis.

Is the blood an inanimate fluid, or is it a live ?

Muſt the blood be converted into a ſolid part of the body, before it can feel ?

Where is the firſt communication between body and mind ?

Does the albuminous fluid inceſſantly paſſing through the Lacteals into the blood, only require the heat of the blood-veſſels to vivify it like incubation, by the warmth of the Hen ; or is its animation reſerved for the lungs ?

Arguments for and againſt the *celebrated J. Hunter*'s hypotheſis of the life of the blood.

The red part of the blood, ſoluble in water, but not in ſerum, capable of undergoing the putrefactive fermentation ; this fermentation, diſtinguiſhed into *three ſtages* ; the proceſs deſcribed, part of the blood goes to form the various fluids ; part to repair the waſte of the ſolids ; and part is deſtroyed and thrown out.

The fluids of animals are formed and deſtroyed by fermentation. What *we mean* by FERMENTATION.

Putrefaction defined—conſiſts of *two* fermentations.

A portion of the blood is conſtantly deſtroying. Is it by what we call putrefaction ?

The

The evident evacuations from the blood, are (1.) From the ſkin by evaporation. (2.) From the ſurface of the lungs. And (3.) by the kidnies.

Of the grand Antiſeptic of Animal Bodies.

Some uſes of the blood, beſides thoſe commonly noticed.

Of the actions of the ſmall veſſels when divided by a ſmall wound. How in conſequence of a ſlight inflammation, they throw out a new fluid, in order to effect a reunion. This uniting medium, that part of the blood called the *Coaguable Lymph.*

Is not inflammation a proceſs of the animal œconomy, to ſupply an injured part with Coaguable. Lymph ? Several phenomena related to countenance this idea.

On the formation and uſe of *Pus.*

What is the alteration in the veſſels of an inflamed part, producing pus ? How far is it a regular ſecretion.

Of the gloubles of pus, as they appear through the microſcope.

The opinion that the ſolids go to the formation of pus, erroneous.

The intention of pus is not to deſtroy, but to defend and preſerve the parts.

Of

Of the *motion* and *circulation of the blood*, and of the ſeveral *organs* and *actions* employed in ſupporting it.

Of the circulation in the *Fœtus*—in *Amphibious Animals*, and in *Scaly-Fiſhes*.

Of the Lungs.

Anatomical Deſcription of that ſet of veſſels in the Lungs, which contain AIR, and thoſe which contain BLOOD.

Is the blood in the pulmonary arteries incapable of nouriſhment, or muſt its yet crude chyliferous particles complete the circle of the ſyſtem, before it can nouriſh?

Of the ſecretions from the veſſels of the Lungs —of the nerves of the Lungs, with their peculiarities.

How reſpiration is performed in *Man*—how in *Birds*—in ſome *Reptiles*, and in *Inſects*. The reaſon *Snakes* can live in an exhauſted receiver, and Inſects exiſt in compact bodies.—How reſpiration is performed in *amphibious Animals* and *Scaly-Fiſhes*.

How the blood circulates in the Child in the Womb.

Nature and properties of the AIR *we commonly breathe.*

On

On the PULSE.—Scarce any two authors uſe the ſame terms to expreſs the ſame pulſe. Several paſſages of Hoffman, Silvius, Etmuller, Decker, Scheldhammar, Bellini, Boerhaave and Proſper Alpinus, compared.

SECTION IV.

On the Heat of the *Human Body*.

HOW far does the heat of animals depend on the motion of the blood? Is the heat owing to the nervous fluid, or Æther, or Electricity, or Phlogiſton?

The power, whatever it may be, which produces, maintains and regulates the heat of the human body in health, produces HEAT when the ſurrounding ſubſtances are heated to a *leſs* degree than 98 degrees of Farenh thermometer; and COLD, when they are heated to a *greater* degree*.

SECTION V.

Of the Stomach and *aſſiſtant Chylopoetic-Viſcera*.

ANATOMICAL deſcription of the *Stomach* and *alimentary* Canal; peculiarity in the diſtribution of the veſſels of the Stomach and Inteſtines.

The

* Fordyce.

The Stomach performs two distinct offices; the first, digesting the food; the second, communicating fresh life and vigour to the remotest parts of the system. HIPPOCRATES opinion of this wonderful organ.—The opinion of ARETÆUS CAPPADOX, of HELMONT, of SYDENHAM, of FOTHERGILL.

No organ merits so much attention as the Stomach,—no function of such importance to the *Physician*, as digestion.—The feeling and affections attributed to the *heart*, belong to the *Stomach*. No part of the body capable of so many different feelings. On the Stomach in a great measure depends the whole man,—various examples adduced.

Of the consent between the *skin* and the *Stomach*.

A state of distention or erection in the *ultimæ vasculæ* or *villi* of the nerves necessary to free perspiration—this distended or collapsed state is somehow connected with a sound or unsound Stomach?

On Digestion.

Systems relative to this function.

(1.) BOERHAAVE's, which supposes *two principal agents*, viz.—the different fluids collected in the Stomach,

Stomach—and its mechanical action. The *ſecondary* agents are, (1.) heat, (2.) air, (3.) the nervous fluid, and (4.) an incipient fermentation.

(2.) Sir John Pringle's and Dr. M'Bride's theory, who ſuppoſe it a fermentative proceſs. Fermentation divided into *three* ſtages. Chymical Analyſis of the gaſtric fluid; found to be neither acid, nor alcaline, but neutral.

Experiments in *Papin's Digeſter*, not applicable to the human Stomach.—The amazing power in the cold Stomach of ſome Fiſhes, ſufficient to overturn the ſyſtem that ſuppoſes *heat* the grand inſtrument of digeſtion.

The amazing preſſure of the Stomach as calculated by Dr. Pitcairn and others, entirely without foundation.

The *Experiments of* Spallanzani.

How digeſtion is performed in animals with *muſcular Stomachs*, as common fowls, turkeys, pigeons, &c. Their food triturated previous to digeſtion, by muſcles called *gizzards*. The action of the gizzards upon ſharp pointed metallic bodies.—Anatomical deſcription of the Œſophagus and gizzards of fowls.—Of the Crop, its glands, cartilaginous coat and excretory ducts.

How

How digeſtion is performed in animals with *intermediate ſtomachs*; what we are to underſtand by *intermediate ſtomachs*. Experiments proving that in ſuch animals, digeſtion is owing to the *gaſtric fluid alone*.

How digeſtion is performed in the *reptile tribe*; quicker accompliſhed in warmer ſeaſons. During their torpid ſtate, fleſh may remain in their ſtomachs for months without putrefying.

How digeſtion is performed in *ſcaly fiſhes*.—Anatomical deſcription of their ſtomach and inteſtines. Their ſtomachs remarkably *cold*, with no poſſibility of triture. Some fiſh digeſt crabs, lobſters, ſhells and all. The bottom of their ſtomachs digeſts ſubſtances ſooner than the upper part. This ſolvent power greater in the ſtomachs of fiſhes than any other creature we know of; few animals can digeſt an entire live animal. In fiſhes the gaſtric fluid *alone* diſſolves the ſmall live fiſh they ſwallow.

The proceſs of digeſtion in *ſheep*, *oxen*, and other *ruminating animals*;—wherein their ſtomach and bowels differ from man's. How digeſtion is performed in *birds of prey*—anatomical deſcription of their digeſtive organs, their ſtomachs approach near to the human; have a double pancreas.

Reſult

Reſult of experiments on the gaſtric juice of birds of prey ; it will not diſſolve vegetables, even if boiled, yet their ſtomachs diſſolve the hardeſt bones. Digeſtion in birds of prey proved to be owing to the gaſtric fluid alone.

General obſervations on the gaſtric fluid of animals. Does not freeze ſo ſoon as a ſolution of ſalt, or of ſimple water. The human gaſtric juice expoſed for weeks in the hotteſt ſeaſons, ſuffers no change of colour, taſte or ſmell. The gaſtric juice of birds of prey, diſſolves fleſh out of the body, ſooner than the proceſs of putrefaction.

Fleſh given to a ſick bird of prey, found unaltered.—Teeth given to the ſame claſs of birds, the fangs diſſolved, the enamel untouched ! Horns and tanned leather indiſſoluble—the Tendo Achillis of an ox dried, perfectly ſoluble. Raw fleſh and other ſubſtances, diſſolved when tied up in a linen, and even in a broad-cloth bag, and thrown into the ſtomach of an eagle.

The proceſs of digeſtion in animals with *membranous ſtomachs*. This claſs comprehends the inhabitants of ſalt and freſh water ; *Amphibious animals*, as the tortoiſe, frog, water-ſnake, &c. *Reptiles*, as the viper, land-ſnake, &c. *Quadrupeds*,

as the horſe, ox, cat, dog, &c. Alſo, birds of prey, as the eagle, owl, &c. And laſtly, MAN himſelf.

Of the advantages of comparative anatomy and analogical reaſoning. Analogical arguments probable, but not concluſive. How plauſible inferences from well known facts in brutes, occaſioned many errors reſpecting man.

In ſome animals trituration of the food is neceſſary—in man it is done by the *teeth*—in gallinaceous fowls, by the *gizzards*.

In frogs, ſerpents, birds, and fiſh of prey, no trituration takes place.

Wherein man's digeſtive faculties differ from all other animals.

Man is OMNIVOROUS.

Of the *coaguable liquor* of the human ſtomach—Of the *runnet* in calves—The inner coat of the ſtomach of gallinaceous fowls, has the ſame property—Thoſe with *intermediate* ſtomachs poſſeſs it likewiſe. The ſtomachs of various reptiles, and ſeveral ſcaly fiſhes, have the faculty of curdling milk.

Is this coagulating property inherent in the internal coat, or is it owing to the gaſtric fluid?

To imagine that nothing but *acids* coagulate milk, is to meaſure nature by our own narrow prejudices?

prejudices? The blood of a certain animal will not coagulate milk, but pieces of the heart, liver, lungs, and ſome other parts of the *ſame* animal, will.

RECAPITULATION. The *ſuccus gaſtricus* differs from all known ſolvents of art or nature. It is at once, an antiſeptic and ſolvent. In ſome quadrupeds, in ſome birds of prey, it actually ſweetens putrid fleſh in leſs than two hours.

Wherein the *ſuccus gaſtricus* eſſentially differs from the *Saliva*; hence the fallacy attending *Pringle* and *M'Bride*'s concluſions. The reſult of various experiments made by *Reaumur*, *Spallanzani*, *J. Hunter*, *Stevens*, and others, only confirms the opinion advanced *two thouſand* years ago, by HIPPOCRATES.

If digeſtion is well performed, the chyle is proper, be the food ever ſo various; the blood from the chyle natural—the ſecretions—nutriment—and excretions, regular;—health, ſtrength, and activity, will enſue—diſeaſe vaniſh. If digeſtion languiſh, the contrary happens, be the food what it may, unleſs the injured faculties of digeſtion, be reſtored to their priſtine and natural ſtate. *

On the food of Man.

ALL the food uſed by mankind conſiſts of farinaceous,

* Fothergill.

farinaceous, or mucilaginous vegetable ſubſtances or native vegetable acid—or ſugar or expreſſed oil, or animal ſolids, or animal fluids, containing a mucilaginous matter—all traced ultimately to *vegetables* and *water*.

A view of the TERRAQUEOUS GLOBE. Of the CIRCULATION between the *ocean*, the *atmoſphere*, and *earth*. The whole terraqueous globe, ſea as well as land, together with the whole region of the atmoſphere, happily contrived to afford ſweet and running waters, all of which have a reference to the original food of man, VEGETABLES.

VEGETATION traced from the *ſowing of the ſeed*, to the formation of the root—the trunk—the branch—the flower—the fruit—and laſt of all, to the ſeed *again*.

THE SEXUAL SYSTEM OF BOTANY, briefly explained.

Analogy of vegetables to animals.

CHAP. IV.

Structure, Courſe, and Œconomy of the VALVULAR LYMPHATIC SYSTEM.

THE ABSORBENT SYSTEM conſiſts of (1.) the *Lacteals*. (2.) The *Common Lymphatic Veſſels*. (3.) The *Thoracic Duct*. And (4.) the *Glands*, called *Conglobate*.

A

A Lymphatic, is a fine pellucid tube nearly cylindrical, divided by valves, ſo as to have the reſemblance of joints. *

Hiſtory of their diſcovery.

The Lacteals begin from the inteſtinal tube, and may with propriety be called the *Lymphatics of the Inteſtines*, they begin with open mouths, in almoſt every part of the body, as they do in the inteſtines.

The fluid they contain is colourleſs, like water; the courſe of their fluid is from the extreme parts of the body to its center.

The coats of the Lymphatics have in common with other parts, arteries, veins, and nerves.

The Lymphatic Syſtem in moſt animals, † but particularly in man and quadrupedes, is full of valves.

Deſcription of the Conglobate or Lymphatic Glands. The Thoracic Duct, is a lymphatic of the largeſt order: it begins near the Diaphragm, and commonly terminates in the left ſubclavian vein; to it, as the common receptacle, the whole lymphatic ſyſtem tends.

In paſſing on towards the heart, the lymphatics enter the conglobate glands—the manner deſcribed.

* Fordyce.

† Valves have not been found in the lymphatics of *ſcaly fiſhes*,

deſcribed. *Haller*'s opinion of the abſorbing veins, erroneous. As the arteries are evidently connected in ſtructure and office with the Lacteals or Lymphatics of the inteſtines, may they not in like manner with all the reſt in the ſyſtem? Experiments rendering it highly probable that the Thoracic Duct is not the general or only termination of the Lymphatics. Has the Brain Lymphatics? Arguments for and againſt this opinion. Abſorbent glands found in the *foramen caroticum* in the baſis of the ſkull. Why are the glands of the neck more numerous in man than in any other animal?

On the action of the abſorbents: objections to their acting on the principle of Capillary, tubes according to Haller and others—a *particular* ſtimulus required. (See Vis Vitalis, p. 21.)

An explanation of their action attempted—The probability of every living body abſorbing.

THE USE OF THE ABSORBENT OR LYMPHATIC SYSTEM.

The Lymphatics are the *Modulators* of the nutritive or arterial ſyſtem. The Lymphatics and arteries are perpetually counteracting each other. * The

* See part ſecond, on Dropſy.

For a particular deſcription of the courſe of the Lymphatics, ſee *Syſtem of Anatomy, from Monro, Winſlow, and Innes, Edinburgh*, 1784.

The Lymphatics take in our food—They prepare ſeveral ſecreted liquors. The Lymphatic glands, guard the ſyſtem from poiſon by their inflammation and pain.

The Lymphatics take up the *ſolids* as well as the fluids of the body, proved by experiment—they eat off the roots of teeth in children, and abſorb the alveolar proceſſes after the teeth drop out in old men. The ſeparation of a mortified part is by means of the abſorbents. Their action further illuſtrated in diſeaſes of the bones. The abſorbents regulate the quantity and quality of the chyle.

Does the lymphatic ſyſtem in certain diſeaſes, where the patient cannot take food into his ſtomach, abſorb the fat to ſupport the ſyſtem? Obſervations on animals that ſleep all winter.

On favourable and unfavourable ſurfaces for abſorption: An ulcer more favourable to abſorption than an inflammed part.

Does the preſence of one infectious matter prevent the abſorption of another? *

On the good effects of introducing morbific matter by a different rout from what it would naturally take, as in inoculation. Can two infectious diſeaſes act on the body at the ſame time?*

The abſorbent ſyſtem more active after ſleep.

Miſcellaneous obſervations. CHAP.

* See Cruikſh.

CHAP. V.

Nervous Syſtem.

THE BRAIN is that ſoft whitiſh maſs which fills the cavity of the ſkull, and is immediately ſurrounded by two membranes, called *Meninges* by the Greeks, and *Matres* by other ancients: one is very ſtrong, and lies contiguous to the ſkull; the other is very thin, and immediately touches the brain. The firſt is called *Dura Mater*, the laſt *Pia Mater*.

The brain is furniſhed with blood-veſſels in the ſame manner as the other parts, excepting that larger arteries anaſtomoſe, and the ſmaller veins enter more ſuddenly into a larger trunk, whoſe ſides are of a firmer texture†.

In the more perfect or complicated animals, it is contained in the cavity of the ſkull:—in the leſs perfect, it is diffuſed all over the body.

In man, the brain is in a larger proportion to the whole body than any other quadruped, or any bird, or fiſh hitherto known†.

From the white part, maſſes of fibres ariſe, which go to every part of the body. Theſe are called *Nerves*†.

But

† Fordyce.

But ſo ignorant are we of the *origin* of the nerves, that the loweſt in the ſpinal marrow may, for ought we know, come from the top of the brain.

One large maſs paſſes down through the cavity of the ſpine, and is called the ſpinal-marrow†.

The brain, ſpinal-marrow and nerves, are covered with membranes of a very firm texture. The nerves ſent to the organs of the ſenſes, there loſe their firm coats, and terminate in a pulpy ſubſtance.

Of the connexion and dependence of the nerves on the *Hydraulic* part of the machine.

A general view of the Nervous Syſtem‡.

The nervous ſyſtem, as the organ of ſenſe and motion, is connected with ſo many functions of the animal œconomy, that the ſtudy of it muſt be of the utmoſt importance, and a fundamental part of the ſtudy of the whole œconomy.

The nervous ſyſtem conſiſts of the medullary ſubſtances of the brain, cerebellum, medulla oblongata and ſpinalis, and of the ſame ſubſtance continued into the nerves, by which it is diſtributed to many different parts of the body.

† Fordyce. ‡ From Cullen's Phyſiology.

The whole of this ſyſtem may be diſtinguiſhed into four parts—

I. The medullary ſubſtance contained in the cranium and vertebral cavity; the whole of which ſeems to conſiſt of diſtinct fibres, but without the ſeveral fibres being ſeperated from each other by any evident enveloping membranes*.

II. Connected with one part or other of (§ I.) are the *nerves*, in which the medullary ſubſtance is contained; but here more evidently divided into fibres, each of which are ſeperated from the others by an enveloping membrane derived from the Pia Mater.

III. Parts of the extremities of certain nerves (§ II.) in which the medullary ſubſtance is diveſted of the enveloping membranes from the Pia Mater, and ſo ſituated as to be expoſed to the action of certain external bodies, and perhaps ſo framed as to be affected by the action of certain bodies only: theſe we call the *ſentient extremities of the nerves*.

IV.

* When we ſpeak of functions, which are, or may be in common to every part of this portion of the nervous ſyſtem, we ſhall ſpeak of the whole under the title of the *Brain*: but when it is neceſſary to diſtinguiſh particular parts, we ſhall take care to avoid ambiguity, *Cullen.*

IV. Certain extremities of the nerves (§ II.) ſo framed as to be capable of a peculiar contractility; and in conſequence of their ſituation and attachments, to be by their contraction capable of moving moſt of the ſolid and fluid parts of the body. Theſe are named *moving* or *muſcular fibres*.

That muſcular fibres are a continuation of the medullary ſubſtance of the brain and nerves, has not been ſhewn by Anatomiſts, nor univerſally admitted by Phyſiologiſts; but we now ſuppoſe it, and hope afterwards to render it ſufficiently probable.

Are the *Ganglions* of the nerves to be conſidered as a part of the nervous ſyſtem diſtinguiſhed by a peculiar function?

Theſe ſeveral parts of the nervous ſyſtem, are every where the ſame continous medullary ſubſtance, which we ſuppoſe to be the vital ſolids, ſo conſtituted in living animals, and in living ſyſtems only, as to admit of motions being readily propagated from one part to every other part of the nervous ſyſtem, ſo long as the continuity and living ſtate of the medullary ſubſtance remains.

In the living man there is an immaterial thinking ſubſtance or MIND; and every phœnomenon of thinking is to be conſidered as an affection or faculty of the mind alone. But this immaterial

and thinking part of man, is ſo connected with the material and corporeal part of him, and particularly with the nervous ſyſtem, that motions excited in this, give occaſion to thought; and thought, however occaſioned, gives riſe to new motions in the nervous ſyſtem.

It is probable that the motions excited by the application of ſtimuli to a moving and irritable part, or to the nerve going to a moving part, *do not ariſe in the brain*, but immediately in the nerves, or in the part; the brain, in this caſe, only keeping up the life of the part, and rendering it capable of motion*.

A ſubſtance may act on one part as a ſtimulant or ſedative, and have a leſs effect, or none at all, when applied to another, although otherwiſe equally irritable. Such ſtimuli are called *ſpecific*‖. (*See the aphoriſms on the Vis Vitalis.*)

It has been conjectured by ſome, that motion was communicated to parts by a fluid flowing through the nerves as tubes; by others, that it was communicated by vibrations§, and by others, that it ariſes from *electricity*.

Is a nerve a better conductor of electricity than any other part in the ſame ſtate of moiſture?

By

* Fordyce. ‖ See part fourth, *on the action of Medicine.*

§ See Hartley, on Man.

By a moderate preſſure the nervous influence is intercepted.

Natural Hiſtory of the *Torpedo*.—The organ which is ſaid to collect the electricity in this animal is not its brain, which is remarkably ſmall.

Reaſon and *Inſtinct* compared.

Reason is a ſelf-improving power or faculty of the mind.

Instinct is that *diſcretion* which in different degrees is diffuſed through every animal, directing them to chooſe what is good, and to avoid what would be deſtructive to them. It attains its perfection at once, and is moſt apparent where reaſon is weakeſt.

On *Cuſtom* and *Habit*.

Cuſtom is the frequent repetition of any application to the body, capable of affecting the ſenſible or irritable parts; or it is the repetition of any action or motion of the body*.

Habit is the effect of ſuch repetition.

On Exercise, Rest, and Sleep.

CHAPTER VI.

On the Primordia of Animals.

THE generation of animals has excited the curioſity of Philoſophers and Phyſicians from

* Fordyce.

from the time of ARISTOTLE to the preſent; ſtill it is involved in impenetrable darkneſs.

There are facts ſufficient to entirely deſtroy the two famous ſyſtems of the *Epigeneſiſts*, and the *Vermiculiſts*. It is, moreover, a vain and uſeleſs ſpeculation: the two extremes of nature, the very *great*, and the very *ſmall*, are out of ſight; from the grandeur of the one, and the ſubtilty of the other, Admiration itſelf is ſoon overpowered, and ſinks into undiſcerning amazement!

Quomodo ignoras quod venti veſtigium, qualia ſint in Prægnantis Utero oſſa: ſic DEI *opus ignoras qui facit omnia!* ECCLESIASTES, chap. XI. ver. 5.

END OF PART THE FIRST.

In page 5, line 7, of the Introduction, read, "*this goodly frame the* EARTH."